TENDER HEART HIGH SCHOOL, SEC-33B, (H1)

Date 22.4.24

CLASS- IX
CHAPTER- 4

SUBJECT- CHEMISTRY
TEACHER- MOHINISHA THAKUR

Good morning to all the Students!

Students this lesson is of class - VIII for the Subject of chemistry Topic :- 'Isobars' which is covered in 'chapter - 4. 'Atomic structure and chemical bonding' starting on page no - 66 of your text book titled - 'consise' chemistry by 'Selina Publication' and is being submitted to you on

22 April, 2024

All students may now please open page no - 66 of your notebook in front of you.

If all students are ready then let us start with this chapter. All Students may now please listen carefully.

ISOBARS :-

They are atoms of different elements having same mass numbers but different atomic numbers. There is no similarity in physical and chemical properties. e.g - Argon's atomic no is 18 and calcium's atomic no is 20 but they have same mass number. (The sum of their protons and neutrons) $^{40}_{18}Ar$ and $^{40}_{20}Ca$

(P.T.O)

Next we will discuss the topic 'Electrovalent (or Ionic) bond'

We have studied that atoms combine with each other to complete their octet or duplet and become stable. Due to this a force of attraction develops between the atoms which binds them together to form a molecule. This force of attraction is called a chemical bond. We will study two types of chemical bonds - Electrovalent (or Ionic) bond:-

Electrovalent (or Ionic) bond:-

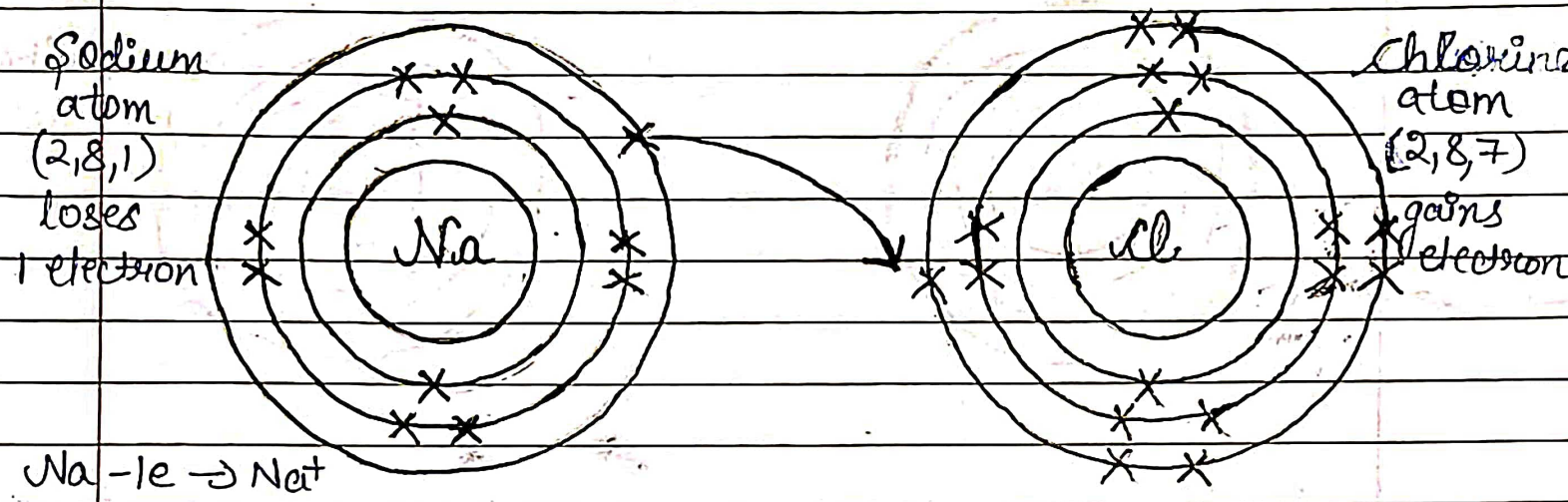
This bond is formed by transfer of electrons from one atom to another. Metal atoms lose electrons to non-metals and form electrovalent compound. Metal atoms have 1, 2 or 3 valence electrons which they can lose to form cations (positive ions). Non-metals have 5, 6 or 7 valence electrons and they gain electrons to form anions (negative ions).

$Na - 1e \rightarrow Na^+$ $\quad$ $Cl + 1e \rightarrow Cl^-$

(+) cation $\rightleftharpoons$ Anion (-) [opposite charge attract]

The opposite charged ions attract each other by a strong force and thus a stable ionic compounds are formed.

(P.T.O)



$Na - 1e \rightarrow Na^+$

$Na^+ \rightleftharpoons Cl^-$ (force of attraction)

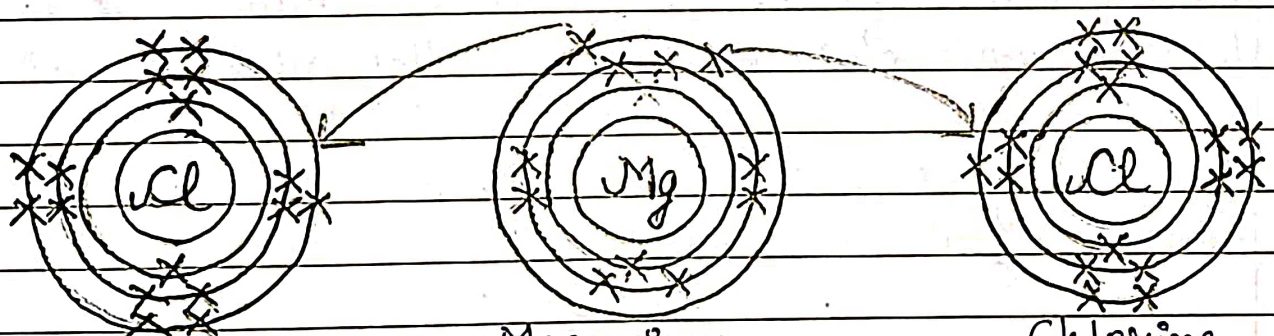
$NaCl$ Sodium chloride

Magnesium chloride $MgCl_2$

$Mg = 2,8,2$ (will lose 2 electrons)

$Cl = 2,8,7$ (will gain 1 electron)

Since magnesium has to lose 2 electrons, it will combine with two chlorine atoms, giving one electron to each chlorine.



Chlorine 2,8,7 $Cl + 1e \rightarrow Cl^-$

Magnesium 2,8,2 $Mg - 2e \rightarrow Mg^{2+}$

Chlorine 2,8,7 $Cl + 1e \rightarrow Cl^-$

$Mg^{2+} + 2[Cl^-] \rightarrow MgCl_2$

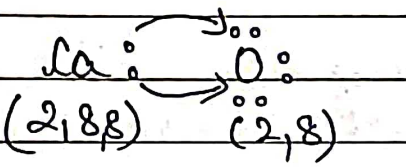
(P.T.O)

Calcium oxide CaO

Ca = 2,8,8,2 will lose 2 electrons.

O = 2,6 will gain 2 electrons.

$Ca - 2e \rightarrow Ca^{2+}$ $O + 2e \rightarrow O^{2-}$



$Ca^{2+} O^{2-} \rightarrow CaO$

Students, Now, we will discuss the next topic of this chapter which is 'Redox Reactions'

REDOX REACTIONS

We have already studied in the last topic that metals lose electrons and undergo oxidation whereas non-metals gain electrons and undergo reduction. During the formation of electrovalent bond, oxidation and reduction are taking place simultaneously. This is only called as redox reaction. Example:-

$2Ca + O_2 \rightarrow 2CaO$

$Ca - 2e \rightarrow Ca^{2+}$ [Oxidation half reaction]

$O + 2e \rightarrow O^{2-}$ [Reduction half reaction]

Displacement reactions are also examples of redox reaction. Example:-

$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

$Cu^{2+} SO_4^{2-}$ $Zn^{2+} SO_4^{2-}$

$Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$

$Zn - 2e \rightarrow Zn^{2+}$ (oxidation)

$Cu^{2+} + 2e \rightarrow Cu$ (reduction)

(P.T.O)

CLASS- IX

SUBJECT- CHEMISTRY

Page No. 5

CHAPTER- 4

TEACHER- MOHINISHA HAKU.

When zinc displaces copper from copper sulphate it forms zinc sulphate by losing 2 electrons. At the same time Cu^{2+} of $CuSO_4$ gains 2 electrons to change into copper. Thus it is a redox reaction.

Now, I will give you three short questions. You will get a three minutes break to write the answers.

The Questions are :-

Q1 :- Give two examples of 'Isobars'.

Q2 :- How many electrons of chlorine atom is present at (M) shell.

Q3 :- Identify Reduction and oxidation in a given reaction.

$$Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$$

I hope you all have written the answers by now. Let us check the answers now.

Ans1 :- ${}^{40}_{18}Ar$ and ${}^{40}_{20}Ca$.

Ans2 :- 7 electrons

Ans3 :- $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$

Reduction

Oxidation

(P.T.O)

CLASS- IX SUBJECT- CHEMISTRY

CHAPTER-4 TEACHER- MOHINISHA THAK

Students, Now I am ending the today's lesson by giving instructions and homework.

INSTRUCTIONS :-

You all are required to read the chapter again and then revise the topics which we have cover today.

HOMEWORK :-

Do Question 2, 4, 6, 7, 8, 11, 12, 13, 17, 19, 20, 21, 22, 23 from the Exercise - 4(C) given on page no - 66 of your chemistry notebook.

X (End) X

TENDER HEART SCHOOL, SEC-33B, CHD

CLASS- VIII SUBJECT- CHEMISTRY

CHAPTER- 4 TEACHER- MOHINISHA THAKUR

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This voice is of Mohinisha Thakur.

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(P.T.O)

CLASS- VIII SUBJECT- CHEMISTRY

DOMS Page No. 2
Date 18/4/22

CHAPTER- 4 TEACHER- MOHINISHA THAKOR

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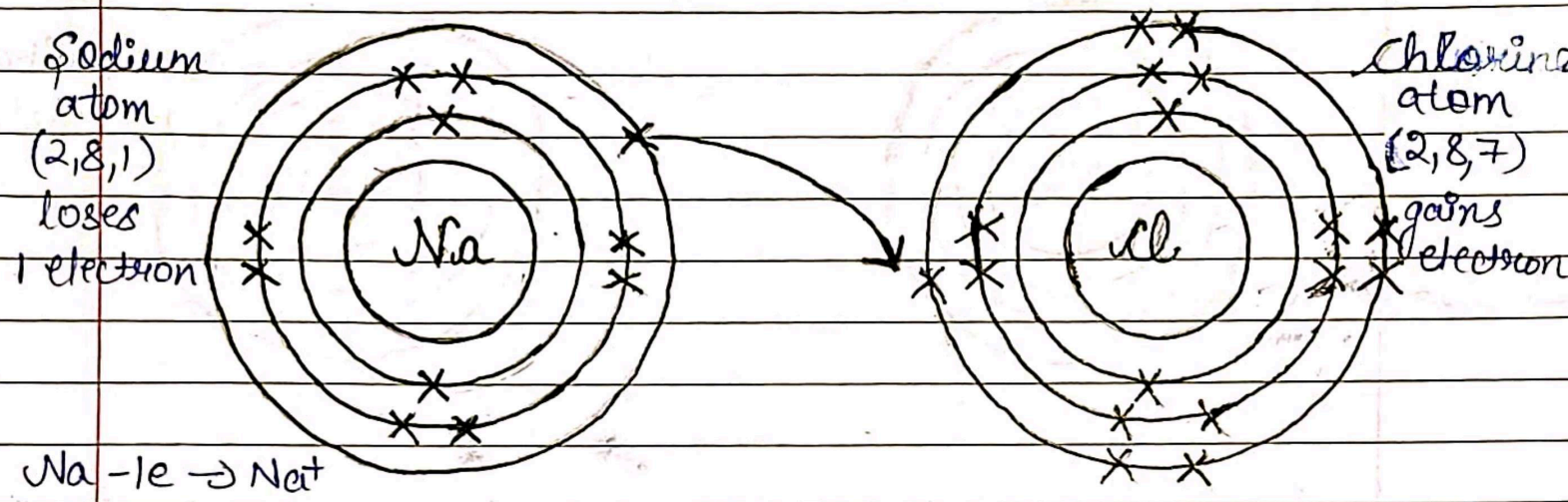
(P.T.O)

CLASS- VIII SUBJECT- CHEMISTRY

DOMS Page No. 3
Date 18/4/22

CHAPTER-4 TEACHER-MOHINISHA THAKUR



$Na^+ \rightleftharpoons Cl^-$ (force of attraction)

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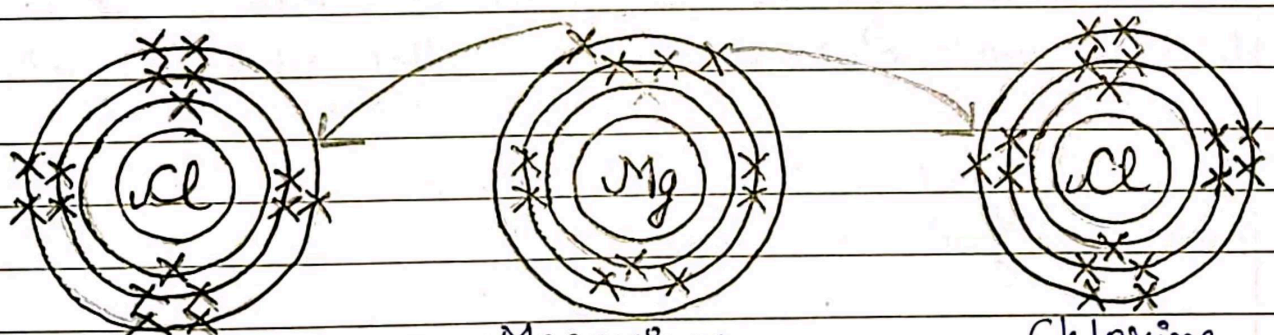

$Mg^{2+} + 2[Cl^-] \rightarrow MgCl_2$

(P.T.O)

CLASS- VIII SUBJECT- CHEMISTRY

DOMS Page No. 4
Date 18/4/22

CHAPTER- 4 TEACHER- MOHINISHA THAKUR

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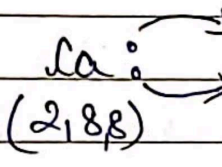

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(P.T.O)

CLASS- VIII SUBJECT- CHEMISTRY

DOMS Page No. 5
Date 18/4/22

CHAPTER-4 TEACHER- MOHINISHA THAKUR

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Oxidation

(P.T.O)

CLASS- VIII SUBJECT- CHEMISTRY

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